Journal of Production, Operations and Systems Management

e-ISSN: 1984-2430

Open Access

Editor-in-chief: Paula de Camargo Fiorini

Received:24/10/24 Approved: 21/11/24

IDENTIFYING CRITERIA FOR PRIORITIZING PROCESS TRANSFORMATION PROJECTS

IDENTIFICAÇÃO DE CRITÉRIOS PARA PRIORIZAÇÃO DE PROJETOS DE TRANSFORMAÇÃO DE PROCESSOS

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ABSTRACT

Purpose – Considering that diverse processes and peculiarities are found across organizations, defining which processes are best suited for prioritization in improvement or transformation projects is vital. The aim of this study was to identify in the literature possible criteria to be considered when making decisions regarding the prioritization of processes to be included in the transformation activities of organizations.

Design/methodology/approach – The present research, classified as qualitative and applied, has adopted the literature review process with the aim of identifying and analyzing articles drawn from the Web of Science, Scopus and Scielo databases relating to process prioritization criteria in transformation projects.

Findings – A total of 24 criteria for decision-making when prioritizing processes in improvement and transformation projects were identified. The criteria were classified into 5 categories (strategy, financial, quality, impact on customers, and efficiency), and a generic hierarchical structure based on the AHP (Analytic Hierarchy Process) for multi-criteria decision-making is proposed.

Originality/Value – Although no universal criteria were identified in the literature that could be adopted by any given organization, significant relevance was noted in terms of the strategic aspects of organizations. The generic structure proposed, establishing criteria and macro-criteria, can be adapted by specialists or AHP practitioners, depending on the type of organization or application environment.

Keywords: Prioritization; Multicriteria; Process; Improvement; Transformation.

RESUMO

Finalidade – Diferentes processos existem dentro das organizações e devido suas particularidades deve se definir quais processos são mais adequados para serem priorizados em projetos de melhorias ou de transformação. Este trabalho teve como objetivo identificar na literatura os possíveis critérios a serem considerados na tomada de decisão com relação a priorização de processos a serem contemplados em ações de transformação em uma organização.
Desenho/metodologia/abordagem – Esta pesquisa se classifica como qualitativa e aplicada, utilizando o procedimento de revisão da literatura com o objetivo identificar e analisar nas bases Web Of Science, Scopus e Scielo artigos relacionados a critérios de priorização de processos em projetos de transformação.
Constatações – Foram identificados 24 critérios para a tomada de decisão na priorização de processos em projetos de melhoria e transformação. Todos os critérios foram classificados em 5 categorias (estratégia, financeiro, qualidade, impacto nos clientes, e eficiência), e foi proposta uma estrutura hierárquica genérica baseada no AHP (Analytic Hierarchy Process) para tomada de decisão multicritério.
Originalidade/Valor – Não foi identificada na literatura indicação de critérios universais que possam ser replicados em toda e qualquer organização, e notou-se grande relevância para aspectos estratégicos da organização. A estrutura genérica proposta com critérios e macrocritérios pode ser adaptada por especialistas ou praticantes do AHP, conforme o tipo de organização ou ambiente de aplicação.
Palavras-chave: Priorização; Multicritério; Processo; Melhoria; Transformação.

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1. INTRODUCTION

Customer perception is a determining factor in the success of organizational strategic planning. Understanding the needs and perceptions of potential customers is crucial to the development and maintenance of processes, products and services. Therefore, the assertive and timely feedback generally offered by optimized processes offers reliability and quality, both of which are perceived by customers (Dincer et al., 2019).

Recognizing the emergence of new technologies, as well as the need for products and/or services to meet new customer requirements, organizations have the challenge of anticipating and meeting these growing needs, which is why designing processes appropriately is crucial to success (Mccormack et al., 2012).

Different processes coexist within organizations, with diverse maturity levels and particularities. Therefore, in strategic decision making the problem of identifying which process should be prioritized in transformation actions arises. Araújo (2019) points out that decision making based on a single criterion is not efficient, and suggests the use of multi-criteria decision-making techniques that consider different criteria aligned with the strategic planning of a given organization. In this way, prioritization will suggest the order in which processes are treated, with greater relevance given to the transformation actions of an organization, increasing the degree of maturity in process management as a consequence.

In summary, implementing transformations through continuous improvement and/or reengineering action requires diverse efforts, often making it difficult to implement process actions across organizational departments at the same time. However, prioritizing the transformation of processes according to appropriate criteria is critical.

The aim of this work was to identify the criteria found in the literature to be considered when making decisions regarding the prioritization of processes to be included in transformation actions in organizations. The work resulted in the proposal of a generic hierarchical structure for multi-criteria decision making when prioritizing processes.

Recognizing that several aspects must be considered to support decision-making, in terms of processes that should be prioritized in transformation actions, justifies the need to consider multi-criteria decision-making techniques. These techniques can, in turn, be defined as methods that consider two or more criteria through an evaluation that starts with qualitative concepts and ends with mathematical weightings (Campolina et al., 2017).

2. LITERATURE REVIEW

2.1 Continuous improvement and process re-engineering

According to Bhuiyan et al. (2006), continuous improvement can be defined as activities that seek to improve performance through employee engagement and the introduction of a culture of sustainable improvement, with the aim of eliminating waste and, consequently, achieving gains in efficiency and quality.

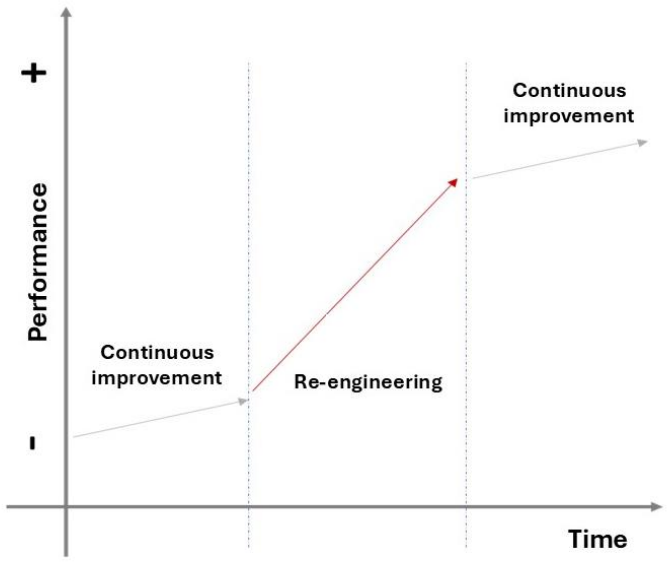
Harter et al. (2000) argue that it is possible to simultaneously reduce costs and increase process efficiency by implementing Continuous Improvement based on actions that mitigate waste. Continuous Improvement actions are disseminated in organizations through the adoption of various methodologies. Among those available are the PDCA cycle (ABPMP, 2013) and Lean Six Sigma (Aboelmaged, 2010).

Unlike Continuous Improvement, Redesign and Reengineering Processes propose the exercise of rethinking the format and the process as a whole, and not just applying incremental improvements characterized by disruptive changes (ABPMP, 2013). Process Redesign, according to the ABPMP (2013, p. 240), "[...] is the end-to-end rethinking of what the process is currently accomplishing [...]", while Process Reengineering, as also defined by the ABPMP (2013, p. 241), is "[...] a fundamental rethinking and radical redesign of processes to achieve dramatic business improvements". [...]".

According to Salvi (2018), adopting Continuous Improvement methodologies means that efficiency gains can be affected with less time and financial investment, while by adopting Reengineering methodologies, efficiency will be more significant, but involve a greater investment of time, money and resources. Figure 1 illustrates that although in both approaches (or methodologies), Continuous Improvement and Reengineering, gains in performance are made; in the case of implementing reengineering projects, the increase in performance is significantly greater. As well as publications related to Continuous Improvement methodologies, there are several related to Process Reengineering, such as that by Cronemyr and Danielsson (2013). Based on the above, it can be understood that, if the desire is to improve an existing process, i.e. to gain speed, quality and, consequently, efficiency along the way while basically carrying out the same process, the most suitable option is to use methodologies focused on process improvement.

Figure 1

Performance gain (Continuous Improvement vs. Reengineering)



Source: adapted from ABPMP (2013).

However, there are situations in which radical changes are required. Such situations might be motivated by issues involving technological evolution, competitor practices and changes in the mindset of employees. In these cases, applying methodologies involving Process Reengineering is advised (ABPMP, 2013).

2.2 Process prioritization

Cronemyr and Danielsson (2013) highlight the need to consider, among other factors, the strategic planning of organizations. Additionally, the authors recommend that the perspective of processes for short, medium and long-term actions should be considered, contributing to the assertiveness of the improvement or reengineering actions being proposed, evaluating the alternatives and considering the processes of organizations as a whole.

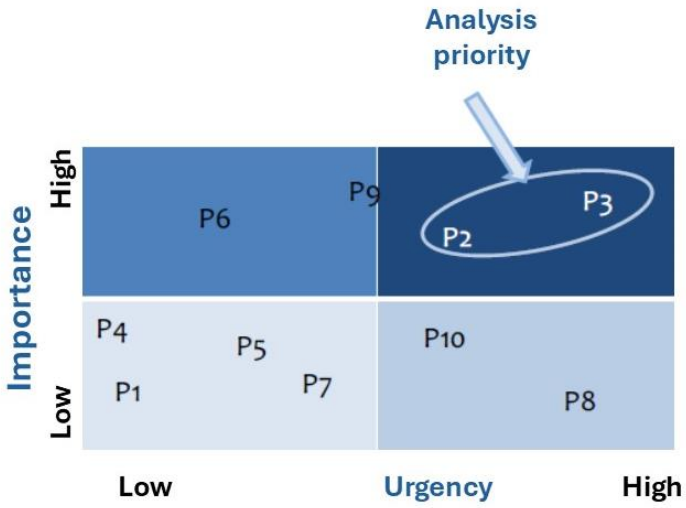
Briozo and Musetti (2015) suggest that there may be several factors that influence the decision to recommend those processes to be analyzed, whether due to complexity, profitability and/or strategy. Prado (2016) points out that certain processes can influence others, either due to continuity or the need for synergy. Thus, the sequence of processes to be analyzed and

considered in improvement or reengineering projects can directly influence the outcome of actions, and may even be decisive for the success of the subsequent transformation actions.

The ABPMP (2013) highlights the need to establish governance in order to establish prioritization criteria. Such criteria may be diverse, ranging from performance-related issues to the need to adapt to a legal requirement; establishing scores to be assigned in relation to the importance and urgency of these processes is also suggested, in order to order and classify them in a matrix. Figure 2 shows the Urgency versus Importance Matrix, being one of the methods used for prioritization.

Figure 2

Urgency versus Importance Matrix



Source: ABPMP (2013, p. 110).

According to Severo (2017), among the aspects that must be taken into account when assessing the prioritization of processes are strategic impact, customer perception, scope of the process, difficulty and duration of implementing the proposed changes. Lima (2017) comments that there are no significant differences in prioritization criteria when considering companies from different segments or of different natures.

Identifying which process(es) should be considered in transformation actions is one of the first activities to be taken, considering the objectives and results expected in organizational

strategic planning (ABPMP, 2013). Ho et al. (2016) presented aspects related to prioritizing processes with a focus on raising their maturity. However, the approach under investigation did not account for the different areas of action, nor consider multi-criteria approaches to support decision-making.

According to Torre (2018), since decision-makers must consider various factors according to the interests of those involved in the decision-making process, it is essential to carry out a survey of the most relevant criteria. Mussa et al. (2018) reinforce this understanding, by recommending that instead of considering a single criterion for decision-making, different criteria related to organizational strategy must be taken into account, if previously established objectives are to be achieved. There are various techniques to help prioritize processes, the Analytic Hierarchy Process (AHP) notable among them.

2.3 AHP method

Multicriteria decision-making techniques correspond to a set of methods that support decision-making, where two or more criteria are considered mathematically and simultaneously (Campolina et al., 2017). Thokala et al. (2016) further define multi-criteria decision-making techniques as a structured processes based on conditions of uncertainty that combine quantitative and qualitative issues to evaluate and compare alternatives that, by such means, achieve mutual understanding among the various stakeholders of the issue being evaluated.

According to Briozo and Musetti (2015), increased access to information in recent decades has become a determining factor in the decision-making process, new methods having emerged to seek greater assertiveness in decisions. According to Bohnenberger et al. (2018), the acceptance and adoption of multi-criteria methods is continually increasing, the differential of such methods being their consideration of several variables, whether qualitative or quantitative.

Roy and Boyssou (1985 cited by Gomes, 2017) presented situations in which the evaluation of multiple criteria can and should be considered, such as:

- Choice: determines the choice of an alternative from among viable alternatives.
- Classification: grouping alternatives in order.
- Sorting / Ranking: creating an ordered list of alternatives, starting from the best (or most suitable) to the worst.
- Description: identifying the characteristics that distinguish the alternatives from each other.

The AHP (Analytic Hierarchy Process) method was developed by Thomas L. Saaty in the 1970s with the aim of assisting decision making in complex problems, irrespective of the research area. Notable examples include priority setting, cost-benefit assessment and resource allocation, among others (Shimizu, 2010). Another relevant point is the possibility of relating AHP to other techniques, such as fuzzy logic and the Delphi method. The method is also well-renowned amongst users for its ability to bring consensus to conflicting situations (Briozo and Musetti, 2015).

Salomon (2002) suggests that the method be implemented in three stages: starting with a structuring of the model (a hierarchy set up to support decision-making), the method moves on to making judgments (evaluating the criteria presented), and ends with a synthesis of the results.

In addition to pointing out that the AHP method aids decision-making, Freitas and Viana (2013) emphasize the use of the method in business to solve diverse problems, including prioritizing processes. The AHP method can be adopted to different applications, whether for decision-making in prioritizing processes and/or projects (Torre, 2018), distributing resources and/or investments (Oliveira, 2019), or comparing alternatives and their possible impacts (Qin et al., 2020).

Notable among the publications related to the topic was the high adoption frequency of the AHP method in situations of performance evaluation or where ordering of alternatives (ranking) was required. Consequently, Ordering / Ranking is the approach that has been adopted for this article: the prioritization perspective which aims to effect hierarchical order (Gomes, 2017). This, according to the order presented, will establish which processes should be prioritized in transformation actions.

3. METHODOLOGY

The present research is classified as qualitative and applied, and adopts the literature review procedure. In order to identify research related to process prioritization criteria for transformation projects, searches of academic databases were carried out.

The search of databases (Web of Science, Scopus and Scielo) considered documents published after 2010. The search strings, which combined “BPM” or “Business Process” with the words “AHP” or “multicriteria”, returned a total of 250 (two hundred and fifty) publications, distributed as follows:

- 71 (seventy-one) publications from Web of Science;

- 178 (one hundred, seventy-eight) from Scopus, of which 42 (forty-two) publications were also found on Web of Science;
- 1 (one) from Scielo.

Another database searched was the Catalogue of Dissertations (CAPES/SUCUPIRA). In this case, the keywords adopted for the search were the combination “BPM” or “Prioritization”. It is worth noting that the term “English” was not used, as most of the documents in this database are written in Portuguese. Since the initial search returned many irrelevant or unrelated results, various filters were then applied with the intention of honing the search results. These filters are detailed in Table 1.

Table 1

Results of the bibliographic search of the Dissertations Catalog

Filter / Providence	Parameter / Action	Number of results
Initial Result:	Search considering the keywords “BPM” or “Prioritization”	1938
Academic level:	"Master" or "Doctor".	1874
Major area of knowledge	"Human, social and Applied sciences", "Engineering” and “Multidisciplinary”	1341
Year of publication restriction:	Greater or equal to 2010.	916
Areas of Evaluation (Considering):	" Public and business administration, accounting sciences and tourism ", "Applied social sciences" and "Engineering".	462
Areas of knowledge (Disregarding):	“Accounting sciences”, “Information sciences”, “Chemistry” and “Biochemistry”, Engineering: “Aerospace”, “Biomedical”, “Civil”, “Materials and metallurgy”, “Mining”, “Transportation”, “Electrical”, “Hydraulic”, “Mechanical”, “Naval”, “Oceanic”, “Nuclear” and “Sanitary”.	236
Reading criteria	Reading titles, abstracts and objectives to identify relevant documents.	21

Source: Own authorship.

Further referring to Table 1, it is important to note is that the last filtering stage, which reduced the number of selected publications from 236 (two hundred and thirty-six) to 21 (twenty-one), was carried out by reading the titles, abstracts and purpose of each publication in order to identify which were relevant to the progress of the present research.

Thus, considering the 4 data sources, 81 (eighty-one) publications relevant to the topic were selected. These are summarized and classified in Table 2.

Table 2

Results of searches of the academic databases

Databases	**Result of the number of searched articles**	**Discarded after reading criteria** (Duplicates across the Scopus and WoS databases, also discarded)	**Relevant and utilized in the analysis**
Scopus	178	138	**40**
Web Of Science	71	52	**19**
Scielo	1	0	**1**
Catalogue of Dissertations (Sucupira - CAPES)	21	0	**21**
Total	271	190	**81**

Source: Own authorship.

4. RESULTS AND DISCUSSION

A total of 24 prioritization criteria were identified in the literature. These are listed in the second column of Table 3 and categorized into 5 macro-criteria groups (Strategy, Financial, Quality, Impact on Customers, and Efficiency), according to the macro-criteria consideration given in the first column of the table. The third column shows the authors who cite the criteria and the last column the number of references that cite each criterion.

Oldoni (2017) and Schauenburg (2014) are the authors who cite the largest number of criteria (14 each), followed by Sousa (2018) with 12 criteria and Mariano (2015) and Piechnicki (2013) citing 10 criteria each. The most cited criteria were Strategic Alignment and Operating Costs (with 17 references citing these criteria), followed by Process Quality (cited by 12 references) and Financial Return (cited by 11 references).

Table 3

Categories, criteria, authors and number of references citing each criterion

Categories (Macro criteria)	**Criteria**	**References citing each criterion**	**Number of references**
Strategy	Strategic Alignment	Cho and Lee (2011); Hatami and Asadi (2012); Ferreira (2013); Lopes (2013); Piechnicki (2013); Reys (2014); Santos (2014); Tarichi (2014); Mariano (2015); Yamane (2016); Lima (2017); Oldoni (2017); Viana (2017); Sousa (2018); Torre (2018); Cunha (2019); Dobrosavljevic, Urosevic (2020).	17
Finance	Operational Costs	Cho and Lee (2011); Hatami and Asadi (2012); Lopes (2013); Ferreira (2013); Piechnicki (2013); Santos	17

		(2014); Schauenburg (2014); Tarichi (2014); Mariano (2015); Yamane (2016); Oldoni (2017); Viana (2017); Torre (2018); Oliveira (2019); Cunha (2019); Sousa *et al.* (2019); Brkic *et al.* (2020).	
Quality	Process quality	Cho e Lee (2011); Hatami and Asadi (2012); Ferreira (2013); Piechnicki (2013); Santos (2014); Schauenburg (2014); Tarichi (2014); Mariano (2015); Yamane (2016); Sousa *et al.* (2019); Oliveira (2019); Dobrosavljevic e Urosevic (2020).	12
Finance	Financial return	Cho e Lee (2011); Lopes (2013); Piechnicki (2013); Schauenburg (2014); Yamane (2016); Oldoni (2017); Viana (2017); Souza (2018); Oliveira (2019); Sousa *et al*. (2019); Brkic *et al.* (2020).	11
Strategy	Innovation	Hatami e Asadi (2012); Piechnicki (2013); Reys (2014); Schauenburg (2014); Oldoni (2017); Cunha (2019); Brkic *et al.* (2020).	7
Impact on clients	Number of clients involved	Schauenburg (2014); Viana (2017); Oldoni (2017); Sousa *et al.* (2019); Cunha (2019); Brkic *et al*. (2020).	6
Strategy	Project complexity	Ferreira (2013); Schauenburg (2014); Mariano (2015); Oldoni (2017); Souza (2018); Oliveira (2019).	6
Quality	Compliance of the processes and products	Cho e Lee (2011); Piechnicki (2013); Reys (2014); Schauenburg (2014); Mariano (2015); Dobrosavljevic, Urosevic (2020).	6
Impact on clients	Client perception of quality	Lopes (2013); Piechnicki (2013); Tarichi (2014); Schauenburg (2014); Oldoni (2017); Brkic *et al.* (2020).	6
Efficiency	Repetitive processes	Cho and Lee (2011); Hatami and Asadi (2012); Lopes (2013); Mariano (2015); Yamane (2016); Brkic *et al.* (2020).	6
Strategy	Replicability of the solution	Piechnicki (2013); Schauenburg (2014); Yamane (2016); Oldoni (2017); Cunha (2019); Sousa et al. (2019).	6
Strategy	Speed of the execution of activities	Ferreira (2013); Santos (2014); Mariano (2015); Oldoni (2017); Sousa (2018); Torre (2018).	6
Efficiency	Increase in efficiency	Cho e Lee (2011); Piechnicki (2013); Sousa (2018); Brkic *et al.* (2020).	5
Strategy	Scalability	Piechnicki (2013); Schauenburg (2014); Oldoni (2017); Sousa *et al*. (2019); Cunha (2019).	5
Strategy	Number of users affected	Ferreira (2013); Schauenburg (2014); Tarichi (2014); Mariano (2015); Oldoni (2017).	5
Efficiency	Average number of transactions / operations	Cho e Lee (2011); Santos (2014); Mariano (2015); Sousa *et al*. (2019); Brkic *et al* (2020).	5
Strategy	Estimate of project delivery	Reys (2014); Lima (2017); Oldoni (2017); Sousa (2018).	4
Strategy	Dependence on other projects	Schauenburg (2014); Oldoni (2017); Torre (2018); Sousa *et al.* (2019).	4
Strategy	Time in backlog	Reys (2014); Yamane (2016); Viana (2017); Lima (2017).	4
Strategy	Implementation urgency	Hatami and Asadi (2012); Reys (2014); Lima (2017); Oldoni (2017); Dobrosavljevic, Urosevic (2020).	3

Strategy	Non-dependence on Intellectual Capital	Hatami and Asadi (2012); Schauenburg (2014); Mariano (2015).	3
Quality	Reliability of the process	Schauenburg (2014); Tarichi (2014).	2
Strategy	Safety	Hatami and Asadi (2012); Cunha (2019).	2
Strategy	Technical knowledge of the team	Reys (2014); Schauenburg (2014); Lima (2017).	1

Source: Own authorship.

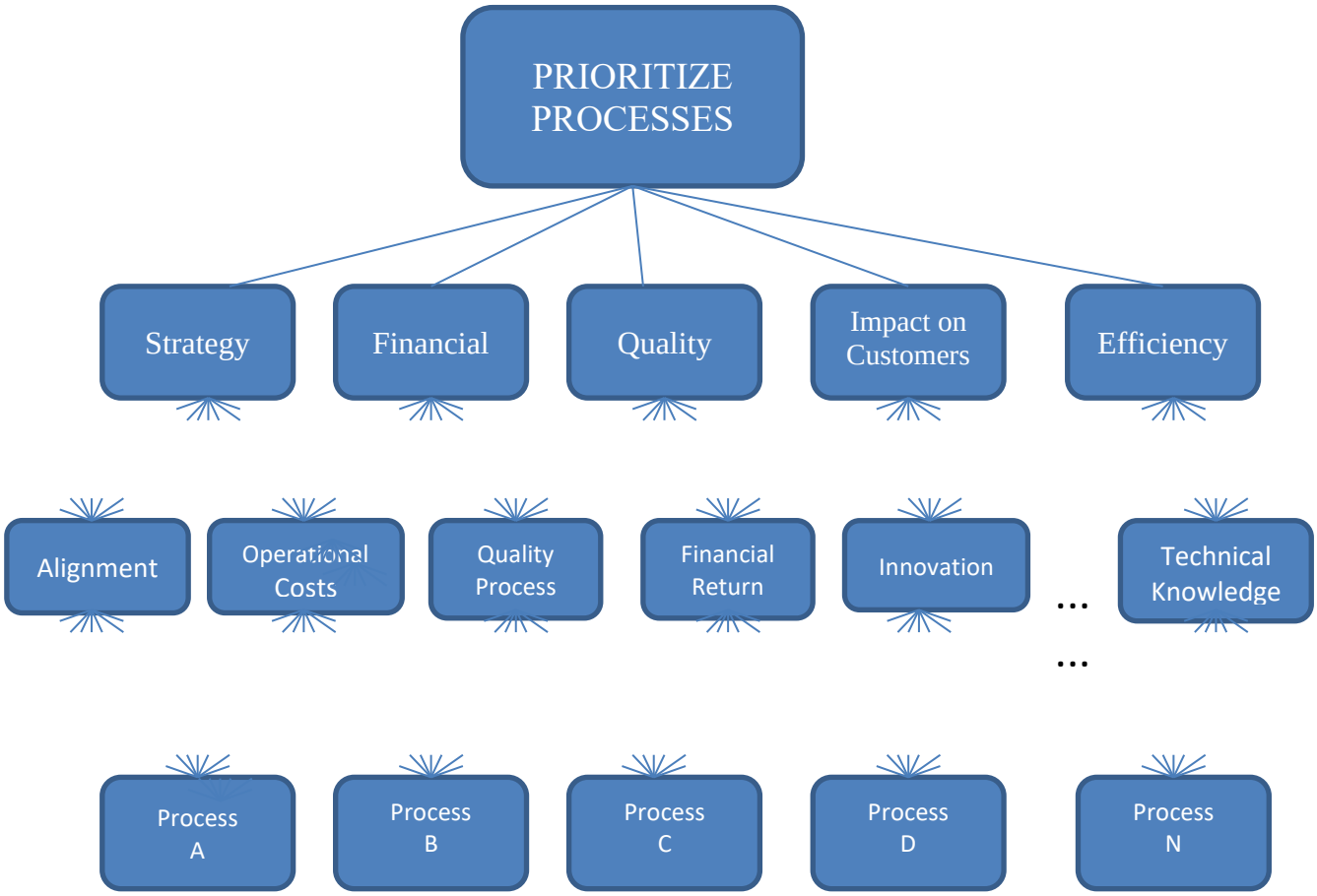
It can be seen that the criteria related to the “Strategy” category are the most prevalent in the literature, with the highest total number of citations in references, followed by the “Financial” category. However, criteria such as “Replicability” and “Innovation”, which are related to the “Strategy” category, may have a direct and/or indirect impact on the other categories. In other words, although the criteria can be categorized according to their functionality or dominant relationship, a criterion from one category may be related to and influence another category. At the same time, no universal criteria have been identified in the literature that can be replicated in any organization or sector. The conclusion drawn from this is that it is necessary to select and adapt the criteria that are most compatible with the environment or organization in which a decision will be made, considering which processes have priority in improvement or transformation projects.

After identifying the criteria and sub-groups (referred to here as macro-criteria), a generic hierarchical structure can be proposed that includes these criteria and macro-criteria, as shown in Figure 3 below.

Thus, given the decision to prioritize 'n' processes (represented by processes A, B, C, D, ... 'n' in Figure 3), the second level of the structure would be the so-called macro-criteria (Strategy, Financial, Quality, Impact on Customers, and Efficiency categories), and on a third level the 24 criteria identified in the literature. This structure can be used with the AHP method (Analytic Hierarchy Process) (Saaty and Vargas, 2012).

Figure 3

Proposal for a generic hierarchical structure for prioritizing processes



Source: Own authorship.

5. CONCLUSION

The aim of this article was to search the literature for criteria concerning the prioritization of processes in improvement and transformation projects. No universal criteria were identified in the literature that could be replicated in any organization. However, there is significant relevance in terms of the strategic aspects of organizations. The most commonly used criteria include Strategic alignment, Operating costs, Financial returns, Innovation and Quality. All the criteria were classified into 5 categories and then a generic hierarchical structure was proposed for multi-criteria decision making. Once this generic structure has been adopted, the criteria and macro-criteria can be adapted by specialists or AHP practitioners, depending on the application environment. This is done by selecting criteria and/or macro-criteria, as well as assigning specific weights to such criteria and sub-criteria according to the

judgments made by the AHP method, or even by making the structure compatible with another multi-criteria method.

Some criteria may be redundant or overlap, drawing attention to the “Strategy” category, since the criteria that are judged important are usually those that are strategic for an organization. Therefore, future work could seek to refine the proposed structure considering these and other observations, as well as research the application of this generic structure by adapting it to real cases in different organizations.

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